

WHAT IS CLAIMED IS:

1. An image pickup apparatus comprising:
 - image pickup means;
 - encoding means for encoding a moving picture signal output from the image pickup means using an intraframe encoding method and an interframe encoding method to generate an encoded image signal including therein a plurality of picture groups constituted by an image signal of n frames (n: an integer equal to or larger than two) including intraframe-encoded frames obtained through the intraframe encoding processing and interframe-encoded frames obtained through the interframe encoding process;
 - recording means for recording the encoded image signal generated by the encoding means on a recording medium; and
 - control means for, in accordance with an instruction to start recording of the moving picture signal, controlling the recording means so as to start a recording operation from the image signal of a frame corresponding to the instruction to start the recording operation, and for controlling the encoding means so as to change a structure of the picture groups generated after issue of the instruction to start the recording operation from a structure of the picture groups generated in and before the issue of the instruction to start the recording operation.

2. An image pickup apparatus according to claim
1, wherein the control means controls the encoding
means so as to make the number of intraframe-encoded
frames within each of the picture groups generated
5 after the issue of the instruction to start the
recording operation smaller than that of interframe-
encoded frames within each of the picture groups
generated in and before the issue of the instruction
to start the recording operation.

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3. An image pickup apparatus according to claim
1, wherein the control means controls the encoding
means so as to make the rate of intraframe-encoded
frames within each of the picture groups generated
15 after the issue of the instruction to start the
recording operation lower than that of interframe-
encoded frames within each of the picture groups
generated in and before the issue of the instruction
to start the recording operation.

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4. An image pickup apparatus according to claim
3, wherein the control means further controls the
encoding means so as to insert one frame of the
intraframe-encoded frames into one picture group
25 after the issue of the instruction to start the
recording operation, and so as to insert a plurality
of frames of the interframe-encoded frames into one

picture group in and before the issue of the instruction to start the reading operation.

5 5. An image pickup apparatus according to claim
4 , wherein the control means controls the encoding
means so as to insert one frame of the intraframe-
encoded frames every n frames (n: an integer equal to
or larger than one) in and before the issue of the
instruction to start the recording operation, and so
10 as to insert one frame of the intraframe-encoded
frames every m frames (m: an integer larger than n)
after the issue of the instruction to start the
recording operation.

15 6. An image pickup apparatus according to claim
1, further comprising transmission means for
transmitting the encoded image signal generated by
the encoding means to an external apparatus while
maintaining the encoded state, wherein the control
20 means controls the encoding means so as to change the
structure of the picture groups generated after the
issue of the instruction to start the recording
operation from the structure of the picture groups
generated in and before the issue of the instruction
25 to start the recording operation, in accordance with
the instruction to start the recording operation
issued in the middle of the transmission of the

encoded image signal by the transmission means.

7. An image pickup apparatus comprising:
image pickup means;

5 encoding means for encoding a moving picture
signal output from the image pickup means using a
intraframe encoding method and an interframe encoding
method to periodically combine intraframe-encoded
frames obtained through the intraframe encoding
10 process and interframe-encoded frames obtained
through the interframe encoding process with each
other to generate an encoded image signal;
recording means for recording the encoded image
signal generated by the encoding means on a recording
15 medium; and

control means for, in accordance with an
instruction to start recording of the moving image
signal, controlling the recording means so as to
start the recording operation from an image signal of
20 a frame corresponding to the instruction to start the
recording operation, and so as to make a period at
which the intraframe-encoded frames are inserted
after issue of the instruction to start the recording
operation longer than that at which the intraframe-
25 encoded frames are inserted in and before the issue
of the instruction to start the recording operation.

8. An image pickup apparatus comprising:

image pickup means;

encoding means for encoding a moving picture signal output from the image pickup means using a

5 intraframe encoding method and an interframe encoding method to periodically combine intraframe-encoded frames obtained through the intraframe encoding process and interframe-encoded frames obtained through the interframe encoding process with each

10 other to generate an encoded image signal;

recording means for recording the encoded image signal generated by the encoding means in a recording medium; and

control means for, in accordance with an

15 instruction to start recording of the moving picture signal, controlling the recording means so as to start the recording operation from an image signal of a frame corresponding to the instruction to start the recording operation, and for controlling the encoding

20 means so as to insert the intraframe-encoded frames at a first period in and before issue of the instruction to start the recording operation, and so as to insert the intraframe-encoded frames at a second period longer than the first period after the

25 issue of the instruction to start the recording operation.

9. An image pickup apparatus comprising:

image pickup means;

encoding means for encoding a moving picture signal output from the image pickup means using an intraframe encoding method and an interframe encoding method to generate an encoded image signal;

5 recording means for recording the encoded image signal generated by the encoding means on a recording medium; and

10 control means for, in accordance with an instruction to start recording of the moving picture signal, controlling the recording means so as to start the recording operation from an image signal of a frame corresponding to the instruction to start the recording operation, and for controlling the encoding means so as to carry out the encoding in accordance with an encoding procedure different from the encoding processing in and before issue of the instruction to start the recording operation after

15 the issue of the instruction to start the recording operation.

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10. An image pickup apparatus according to claim 9, wherein the encoding means combines the

25 intraframe-encoded frames obtained through the intraframe encoding process and the interframe-encoded frames obtained through the interframe

encoding process with each other to generate the encoded image signal, and the control means controls the encoding means so as to make a rate of the intraframe-encoded frames after the issue of the instruction to start the recording operation lower than that of the interframe-encoded frames in and before the issue of the instruction to start the recording operation.

10 11. An image pickup apparatus according to claim 9, wherein the encoding means combines the intraframe-encoded frames obtained through the intraframe encoding process and the interframe-encoded frames obtained through the interframe encoding process with each other to generate the encoded image signal, and the control means controls the encoding means so as to make a rate of the interframe-encoded frames after the issue of the instruction to start the recording operation lower than that of the intraframe-encoded frames in and before the issue of the instruction to start the recording operation.

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25 12. An image pickup apparatus according to claim 9, wherein each frame of the moving picture signal is structured by a plurality of blocks each having a predetermined number of pixels, the encoding

- means performs switching between the intraframe encoding and the interframe encoding with respect to each of the blocks, and the control means controls the encoding means so as to make a rate of the 5 interframe-encoded blocks after the issue of the instruction to start the recording operation lower than that of the intraframe-encoded blocks in and before the issue of the instruction to start the recording operation.
- 10.
13. A recording apparatus comprising:
- inputting means for inputting a moving picture signal;
- encoding means for encoding a moving picture 15 signal input from the inputting means using an intraframe encoding method and an interframe encoding method to generate an encoded image signal including therein a plurality of picture groups constituted by an image signal of n frames (n: an integer equal to or larger than two) including intraframe-encoded frames obtained through the intraframe encoding process and interframe-encoded frames obtained through the interframe encoding process;
- recording means for recording the encoded image 20 signal generated by the encoding means on a recording medium; and
- control means for, in accordance with an

instruction to start recording of the moving picture signal, controlling the recording means so as to start a recording operation from the image signal of a frame corresponding to the instruction to start the recording operation, and for controlling the encoding means so as to change a structure of the picture groups generated after issue of the instruction to start the recording operation from a structure of the picture groups generated in and before the issue of the instruction to start the recording operation.

14. A recording apparatus comprising:

inputting means for inputting a moving picture signal;

15 encoding means for encoding a moving picture signal input from the inputting means using a intraframe encoding method and an interframe encoding method to periodically combine intraframe-encoded frames obtained through the intraframe encoding process and interframe-encoded frames obtained through the interframe encoding process with each other to generate an encoded image signal;

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recording means for recording the encoded image signal generated by the encoding means on a recording medium; and

control means for, in accordance with an instruction to start recording of the moving image

signal, controlling the recording means so as to start the recording operation from an image signal of a frame corresponding to the instruction to start the recording operation, and so as to make a period at 5 which the intraframe-encoded frames are inserted after issue of the instruction to start the recording operation longer than that at which the intraframe-encoded frames are inserted in and before the issue of the instruction to start the recording operation.

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15. A recording apparatus comprising:

inputting means for inputting a moving picture signal;

encoding means for encoding a moving picture 15 signal input from the inputting means using a intraframe encoding method and an interframe encoding method to periodically combine intraframe-encoded frames obtained through the intraframe encoding process and interframe-encoded frames obtained 20 through the interframe encoding process with each other to generate an encoded image signal;

recording means for recording the encoded image signal generated by the encoding means on a recording medium; and

25 control means for, in accordance with an instruction to start recording of the moving picture signal, controlling the recording means so as to

start the recording operation from an image signal of
a frame corresponding to the instruction to start the
recording operation, and for controlling the encoding
means so as to insert the intraframe-encoded frames
5 at a first period in and before issue of the
instruction to start the recording operation, and so
as to insert the intraframe-encoded frames at a
second period longer than the first period after the
issue of the instruction to start the recording
10 operation.

16. A recording apparatus comprising:
inputting means for inputting a moving picture
signal;
15 encoding means for encoding a moving picture
signal input from the inputting means using an
intraframe encoding method and an interframe encoding
method to generate an encoded image signal;
recording means for recording the encoded image
20 signal generated by the encoding means on a recording
medium; and
control means for, in accordance with an
instruction to start recording of the moving picture
signal, controlling the recording means so as to
25 start the recording operation from an image signal of
a frame corresponding to the instruction to start the
recording operation, and for controlling the encoding

means so as to carry out the encoding in accordance with an encoding procedure different from the encoding processing in and before issue of the instruction to start the recording operation after
5 the issue of the instruction to start the recording operation.

17. An image pickup method for an image pickup apparatus comprising the steps of:

- 10 encoding a moving I picture signal output from image pickup means using an intraframe encoding method and an interframe encoding method to generate an encoded image signal including therein a plurality of picture groups constituted by an image signal of n frames (n: an integer equal to or larger than two) including intraframe-encoded frames obtained through the intraframe encoding processing and interframe-encoded frames obtained through the interframe encoding process;
- 15 recording the encoded image signal generated in the encoding step on a recording medium; and
20 controlling in accordance with an instruction to start recording of the moving picture signal, the recording step so as to start a recording operation from the image signal of a frame corresponding to the instruction to start the recording operation, and for
25 controlling the encoding step so as to change a

structure of the picture groups generated after issue
of the instruction to start the recording operation
from a structure of the picture groups generated in
and before the issue of the instruction to start the
recording operation.

18. An image pickup method for an image pickup apparatus comprising the steps of:

encoding a moving picture signal output from
image pickup means using a intraframe encoding method
and an interframe encoding method to periodically
combine intraframe-encoded frames obtained through
the intraframe encoding process and interframe-
encoded frames obtained through the interframe
encoding process with each other to generate an
encoded image signal;

recording the encoded image signal generated in
the encoding step on a recording medium; and

controlling in accordance with an instruction to
start recording of the moving image signal, the
recording step so as to start the recording operation
from an image signal of a frame corresponding to the
instruction to start the recording operation, and so
as to make a period at which the intraframe-encoded
frames are inserted after issue of the instruction to
start the recording operation longer than that at
which the intraframe-encoded frames are inserted in

and before the issue of the instruction to start the recording operation.

19. An image pickup method for an image pickup apparatus comprising the steps of:

encoding a moving picture signal output from image pickup means using a intraframe encoding method and an interframe encoding method to periodically combine intraframe-encoded frames obtained through the intraframe encoding process and interframe-encoded frames obtained through the interframe encoding process with each other to generate an encoded image signal;

recording the encoded image signal generated in the encoding step on a recording medium; and

controlling in accordance with an instruction to start recording of the moving picture signal, the recording step so as to start the recording operation from an image signal of a frame corresponding to the instruction to start the recording operation, and for controlling the encoding step so as to insert the intraframe-encoded frames at a first period in and before issue of the instruction to start the recording operation, and so as to insert the intraframe-encoded frames at a second period longer than the first period after the issue of the instruction to start the recording operation.

20. An image pickup method for an image pickup apparatus comprising the steps of:

encoding a moving picture signal output from image pickup means using an intraframe encoding method and an interframe encoding method to generate an encoded image signal;

recording the encoded image signal generated in the encoding step on a recording medium; and

controlling in accordance with an instruction to start recording of the moving picture signal, the recording step so as to start the recording operation from an image signal of a frame corresponding to the instruction to start the recording operation, and for controlling the encoding step so as to carry out the encoding in accordance with an encoding procedure different from the encoding processing in and before issue of the instruction to start the recording operation after the issue of the instruction to start the recording operation.

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21. A recording method for a recording apparatus comprising the steps of:

inputting a moving picture signal;

encoding a moving picture signal input in the inputting step using an intraframe encoding method and an interframe encoding method to generate an encoded image signal including therein a plurality of

picture groups constituted by an image signal of n frames (n: an integer equal to or larger than two) including intraframe-encoded frames obtained through the intraframe encoding processing and interframe-
5 encoded frames obtained through the interframe encoding process;

recording the encoded image signal generated in the encoding step on a recording medium; and

controlling in accordance with an instruction to
10 start recording of the moving picture signal, the recording step so as to start a recording operation from the image signal of a frame corresponding to the instruction to start the recording operation, and for controlling the encoding step so as to change a
15 structure of the picture groups generated after issue of the instruction to start the recording operation from a structure of the picture groups generated in and before the issue of the instruction to start the recording operation.

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22. A recording method for a recording apparatus comprising the steps of:

inputting a moving picture signal;
encoding a moving picture signal input in the
25 inputting step using a intraframe encoding method and an interframe encoding method to periodically combine intraframe-encoded frames obtained through the

intraframe encoding process and interframe-encoded frames obtained through the interframe encoding process with each other to generate an encoded image signal;

- 5 recording the encoded image signal generated in the encoding step in a recording medium; and
controlling in accordance with an instruction to start recording of the moving image signal, the recording step so as to start the recording operation
10 from an image signal of a frame corresponding to the instruction to start the recording operation, and so as to make a period at which the intraframe-encoded frames are inserted after issue of the instruction to start the recording operation longer than that at
15 which the intraframe-encoded frames are inserted in and before the issue of the instruction to start the recording operation.

23. A recording method for a recording apparatus comprising the steps of:
inputting a moving picture signal;
encoding a moving picture signal input in the inputting step using a intraframe encoding method and an interframe encoding method to periodically combine
25 intraframe-encoded frames obtained through the intraframe encoding process and interframe-encoded frames obtained through the interframe encoding

process with each other to generate an encoded image signal;

recording the encoded image signal generated in the encoding step on a recording medium; and

- 5 controlling in accordance with an instruction to start recording of the moving picture signal, the recording step so as to start the recording operation from an image signal of a frame corresponding to the instruction to start the recording operation, and for
- 10 controlling the encoding step so as to insert the intraframe-encoded frames at a first period in and before issue of the instruction to start the recording operation, and so as to insert the intraframe-encoded frames at a second period longer
- 15 than the first period after the issue of the instruction to start the recording operation.

24. A recording method for a recording apparatus comprising the steps of:

- 20 inputting a moving picture signal;
- encoding a moving picture signal input in the inputting step using an intraframe encoding method and an interframe encoding method to generate an encoded image signal;
- 25 recording the encoded image signal generated in the encoding step in a recording medium; and
- controlling in accordance with an instruction to

start recording of the moving picture signal, the
recording step so as to start the recording operation
from an image signal of a frame corresponding to the
instruction to start the recording operation, and for
5 controlling the encoding step so as to carry out the
encoding in accordance with an encoding procedure
different from the encoding processing in and before
issue of the instruction to start the recording
operation after the issue of the instruction to start
10 the recording operation.